

WHAT IS CLAIMED IS:

1. A method for making a leadframe for a semiconductor package, comprising:
5 providing a polygonal plate of metal having an upper surface, an opposite, lower surface, and a thickness between the upper and lower surfaces;
 patterning the plate to form a leadframe therefrom, the leadframe including a polygonal frame around a periphery thereof, a plurality of leads, each having an outer end integral with the frame and an inner end extending toward a central region of the
10 frame, and a die pad attached to the frame in the central region thereof and adjacent to the inner ends of the leads, the leads and the die pad each having upper and lower surfaces coplanar with the upper and lower surfaces of the plate, respectively;
 forming a spatulate locking pad into an outer end portion of each lead adjacent to the frame; and,
15 forming a spatulate bonding pad into an inner end portion of each lead adjacent to the die pad, the locking pad and the bonding pad on each lead defining between them a land on the lower surface of the lead.
2. The method of claim 1, wherein the leadframe is patterned from the plate
20 by die-stamping, etching, electrical discharge machining, or laser-beam cutting.

3. The method of claim 1, further comprising forming a recessed shoulder into the lower surface of the die pad around a central portion thereof.

4. The method of claim 3, wherein the locking pad and the bonding pad on each lead are formed into the lead from the lower surface thereof.

5. The method of claim 4, wherein the locking pads, the bonding pads, and the recessed shoulder are formed by coining.

6. The method of claim 5, wherein the locking pads, the bonding pads, and the recessed shoulder are respectively coined to different depths.

7. The method of claim 5, wherein the bonding pads are coined to a depth of about half the thickness of the plate.

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8. A method for making a semiconductor package, comprising:
patterning a polygonal metal plate to form a leadframe therefrom, the leadframe including a polygonal frame around a periphery thereof, a plurality of leads, each having an outer end integral with the frame and an inner end extending toward a central region thereof, and a die pad attached to the frame in the central region thereof

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and adjacent to the inner ends of the leads, the frame, the leads and the die pad each having coplanar upper and lower surfaces, respectively;

forming a spatulate locking pad into an outer end portion of each lead adjacent to the frame, a spatulate bonding pad into an inner end portion of each lead adjacent to the die pad, and a recessed shoulder into the lower surface of the die pad around a central portion thereof, the locking pad and the bonding pad on each lead defining between them a land on the lower surface of the lead;

attaching a semiconductor die to the upper surface of the die pad;

electrically connecting the die to selected ones of the bonding pads; and,

molding a body of an insulative plastic over the die, the die pad, and the leads such that the plastic body surrounds the locking pads, the bonding pads and the recessed shoulder on the lower surface of the die pad and interlocks with them, and such that the rectangular frame is exposed at a lateral periphery of the body, and the lands and the central portion of the lower surface of the die pad are exposed at a lower surface of the body.

9. The method of claim 8, further comprising severing the leads at the lateral periphery of the body and removing the rectangular frame from the package.

10. The method of claim 8, wherein the locking pads, the bonding pads and the

11. The method of claim 8, wherein electrically connecting the die to selected ones of the bonding pads comprises wire-bonding pads on an upper surface of the die to the bonding pads on the leads.

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12. The method of claim 8, wherein the pads on the die are wire-bonded to the bonding pads on the leads by an ultrasonic or a thermo-compression bonding method.

13. A semiconductor package, comprising:

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a metal leadframe, including a plurality of leads arrayed around a central region thereof, each lead having an outer end extending away from the central region and an inner end extending toward the central region;

a locking pad in an outer portion of each lead adjacent to its outer end;

a bonding pad in an inner portion of each lead adjacent to its inner end;

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a land defined on a lower surface of each lead between the locking pad and the bonding pad; and,

a die pad attached to the leadframe in the central region thereof and adjacent to the inner ends of the leads, the die pad having an upper surface and a lower surface, the lower surface having a central portion and a recessed shoulder extending around
20 the central portion.

14. The semiconductor package of claim 13, wherein the die pad is attached to the frame or to at least one of the leads by at least one tie-bar.

15. The semiconductor package of claim 13, wherein each of the leads is about 0.18 mm wide, and wherein the leads have a pitch of about 0.5 mm.

16. The semiconductor package of claim 15, wherein each of the bonding pads is about 0.254 mm wide.

17. The semiconductor package of claim 13, wherein the lands are rectangular.

18. The semiconductor package of claim 13, further comprising:
a semiconductor die attached to the upper surface of the die pad;
a plurality of conductive wires bonded at opposite ends to pads on a top surface of the die and selected ones of the bonding pads on the leads, respectively; and,
a body of an insulative plastic molded over the die, the die pad, and the leads such that the plastic body surrounds the locking pads, the bonding pads and the recessed shoulder on the lower surface of the die pad and interlocks with them, and such that the lands and the central portion of the lower surface of the die pad are exposed through a lower surface thereof.

19. The semiconductor package of claim 13, wherein the leadframe comprises an alloy of copper, aluminum, or iron and nickel.

20. The semiconductor package of claim 18, wherein the insulative plastic of
5 the body comprises an epoxy resin.

